

IN THE CLAIMS:

- 1 1. (Currently amended) An electronically tuned circuit, comprising a power amplifier
2 coupled to an electronically tunable output network, said power amplifier capable of
3 being operated in a large-signal mode, said output network including an electronically
4 tunable reactive component, a device, and a control line, said control line extending
5 between said device and said electronically tunable reactive component, wherein
6 electronic tuning of said electronically tunable reactive component includes non-
7 motor operated electronic tuning when said power amplifier is operated in said large-
8 signal mode, wherein said device is configured to provide for varying a control signal
9 on said control line over more than two values ~~further wherein a control line extends~~
10 ~~to said electronically tunable reactive component~~ for electronically varying reactance
11 of said reactive component over more than two values.
- 1 2. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 output network is adapted to be tuned to a selected frequency.
- 1 3. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 output network is adapted to be adjusted to maintain a match with a varying load
3 impedance.
- 1 4. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 output network is adapted to modulate the signal at said network output.
- 1 5. (Previously presented) An electronically tuned circuit as in claim 4, wherein said
2 output network is further adapted to provide a power-amplifier load-impedance locus
3 that substantially maximizes power-amplifier efficiency.

- 1 6. (Previously presented) An electronically tuned circuit as in claim 4, wherein said
2 output network is further adapted to follow a substantially resistive power-amplifier
3 impedance locus, thereby maintaining power-amplifier efficiency near maximum.
- 1 7. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 output network is adapted to be tuned in accordance with a predetermined set of
3 tuning inputs.
- 1 8. (Previously presented) An electronically tuned circuit as in claim 7, wherein said
2 tuning inputs are selected in accordance with a lookup table.
- 1 9. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 output network is adapted to be tuned in accordance with a predetermined lookup
3 table of tuning inputs.
- 1 10. (withdrawn) An electronically tuned circuit as in claim 1, wherein said output
2 network is adapted to be tuned in accordance with a sample of the amplifier output.
- 1 11. (Withdrawn) An electronically tuned circuit as in claim 1, wherein said output
2 network is adapted to be tuned in accordance with a sample of the network output.
- 1 12. (Withdrawn) An electronically tuned circuit as in claim 1, wherein said output
2 network is adapted to be tuned in accordance with a sample of a radiated signal.
- 1 13. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 electronically tunable reactive component includes an electronically tunable
3 capacitor.

- 1 14. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a transistor.
- 1 15. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a diode.
- 1 16. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a diode having a control terminal.
- 1 17. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a micro electro-mechanical system device.
- 1 18. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a variable-dielectric material.
- 1 19. (Previously presented) An electronically tuned circuit as in claim 13, wherein said
2 electronically tunable capacitor includes a piezo-electric device.
- 1 20. (Withdrawn) An electronically tuned circuit radio-frequency power amplifier as in
2 claim 1, wherein said at least two reactive components include at least one inductive
3 component adapted to be electronically tuned in inductance.
- 1 21. (Withdrawn) An electronically tuned circuit as in claim 20, wherein said at least one
2 inductive component includes a variable- permeability core.
- 1 22. (Withdrawn) An electronically tuned circuit as in claim 20, wherein said at least one
2 inductive component includes a piezo-electric device.

- 1 23. (Withdrawn) An electronically tuned circuit as in claim 1, wherein said at least two
2 reactive components include at least one transmission line adapted to be
3 electronically tuned in electrical characteristics.
- 1 24. (Withdrawn) An electronically tuned circuit as in claim 23, wherein said at least one
2 transmission-line component includes an electrically variable dielectric material.
- 1 25. (Withdrawn) An electronically tuned circuit as in claim 23, wherein said at least one
2 transmission-line component includes an electrically variable magnetic material.
- 1 26. (Withdrawn) An electronically tuned circuit as in claim 1, further comprising a
2 passive filter coupled to said output network for removing undesired harmonic
3 frequencies.
- 1 27. (Withdrawn) An electronically tuned circuit as in claim 1, further comprising a
2 second electronically tuned filter coupled to the amplifier input of said amplifier for
3 tuning the amplifier input.
- 1 28. (Previously presented) An electronically tuned circuit as in claim 1, further
2 comprising a controller, said controller for providing a signal for controlling said
3 electronically tunable output network.
- 1 29. (Previously presented) An electronically tuned circuit as in claim 28, further
2 comprising an envelope detector with an envelope-detector input and
3 envelope-detector output, said envelope-detector output coupled to the input of said
4 controller, said envelope detector being responsive to an input RF signal and
5 providing a modulation input to said controller.

1 30. (Previously presented) An electronically tuned circuit as in claim 28, further
2 comprising a drive-level adjustor coupled for adjusting amplitude of a signal
3 provided to said power amplifier.

1 31. (Previously presented) An electronically tuned circuit as in claim 1, further
2 comprising a digital signal processor coupled to said power amplifier and to said
3 electronically tunable output network, said processor for providing a drive signal to
4 said power amplifier and a tuning signal to said electronically tunable output
5 network.

1 32. (Previously presented) An electronically tuned circuit as in claim 31, further
2 comprising a controller coupled to said digital signal processor and to said
3 electronically tunable output network, wherein output of said digital signal processor
4 is directed to said controller and wherein output of said controller is directed to said
5 electronically tunable output network.

1 33. (Previously presented) An electronically tuned circuit as in claim 1, further
2 comprising a drive-level adjustor coupled for adjusting amplitude of a signal
3 provided to said power amplifier.

1 34. (Previously presented) An electronically tuned circuit as in claim 33, wherein said
2 electronically tunable output network and said drive-level adjuster are adapted to
3 produce a modulated signal.

1 35. (Previously presented) An electronically tuned circuit as in claim 34, wherein said
2 circuit is for providing a desired circuit output, wherein when said desired circuit
3 output is above a threshold said electronically tunable output network is used to
4 control amplitude and when said desired circuit output is below a threshold said
5 drive level adjuster is used to control amplitude.

- 1 36. (Previously presented) An electronically tuned circuit as in claim 33, further
2 comprising a controller for converting a modulation input into tuning signals for
3 control of said electronically tuned network.
- 1 37. (Previously presented) An electronically tuned circuit as in claim 1, further
2 comprising a bias input for setting bias level of said power amplifier.
- 1 38. (Previously presented) An electronically tuned circuit as in claim 37, wherein said
2 bias level is adapted to the minimum level necessary to enable operation of the
3 power amplifier, thereby reducing power consumption.
- 1 39. (Previously presented) An electronically tuned circuit as in claim 37, further
2 comprising a controller for adjusting said bias level in response to frequency,
3 impedance, and modulation inputs.

1 40. (Currently amended) An electronically tuned circuit comprising:

2 (a) means for power amplifying, wherein said means for power amplifying
3 comprises a large-signal mode; and

4
5 (b) means for electronic tuning of said means for power amplifying when
6 said means for power amplifying is operating in said large signal
7 mode, wherein said means for electronic tuning is coupled to said
8 means for power amplifying, wherein said means for electronic tuning
9 comprises an electronically tunable reactive component, a device, and
10 a control line, said control line extending between said device and said
11 electronically tunable reactive component, wherein said electronically
12 tunable reactive component includes non-motor operated electronic
13 tuning, wherein said device is configured to provide for varying a
14 control signal on said control line over more than two values further
15 ~~wherein a control line extends to said electronically tunable reactive~~
16 component for electronically varying reactance of said reactive
17 component over more than two values.

1 41. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation for a
4 selected frequency.

1 42. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation while
4 delivering power to a selected load impedance.

1 43. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide a reactance for optimum class-E operation while
4 simultaneously modulating the output of said electronic-tuning means.

1 44. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and further comprising a fixed
3 reactance for optimum class-E operation at a first frequency, wherein said
4 electronic-tuning means is capable of being tuned to provide said power amplifying
5 means with a load impedance for optimum class-E operation for a selected second
6 frequency.

1 45. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and further comprising a fixed
3 reactance for optimum class-E operation with a first load impedance, wherein said
4 electronic-tuning means is capable of being tuned to provide said power amplifying
5 means with a load impedance for optimum class-E operation with a second load
6 impedance different from said first circuit load impedance.

1 46. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 means for power amplifying operates in class E and said electronic-tuning means is
3 capable of being tuned to provide an impedance for optimum class-E operation
4 when the circuit is delivering a maximum output signal amplitude, and said
5 electronic-tuning means is capable of being tuned to provide suboptimum class E
6 operation when the circuit is delivering less than a maximum output signal
7 amplitude.

1 47. (Withdrawn) An electronically tuned circuit as in claim 1, comprising a plurality of
2 amplifier subsystems coupled to a power combiner for delivery of signals from said
3 amplifier subsystems to a common load, wherein each said amplifier subsystem
4 comprises a power amplifier coupled to an electronically tunable output network,
5 said power amplifier capable of being operated in a large-signal mode, said output
6 network including an electronically tunable reactive component, a device, and a
7 control line, said control line extending between said device and said electronically
8 tunable reactive component, wherein electronic tuning of said electronically tunable
9 reactive component includes non-motor operated electronic tuning when said power
10 amplifier is operated in said large-signal mode, wherein said device is configured to
11 provide for varying a control signal on said control line over more than two values
12 further wherein a control line extends to said electronically tunable reactive
13 component for electronically varying reactance of said reactive component over more
14 than two values.

1 48. (withdrawn) An electronically tuned power amplifier system as in claim 47, wherein
2 said output networks are adapted to be tuned to selected frequencies.

1 49. (Withdrawn) An electronically tuned power amplifier system as in claim 47, wherein
2 said output networks are adapted to be tuned to match desired load impedances.

1 50. (Withdrawn) An electronically tuned power amplifier system as in claim 47, wherein
2 said output networks are adapted to modulate the signals from said power amplifiers.

1 51. (Withdrawn) An electronically tuned power amplifier system as in claim 47, wherein
2 said output networks are adapted to cancel reactances resulting from combining said
3 signals.

1 52. (Withdrawn) An electronically tuned power amplifier system as in claim 47, further
2 comprising a controller for generating drive and control signals for each subsystem.

1 53. (Withdrawn) An electronically tuned power amplifier system as in claim 52, wherein
2 said controller is adapted to generating drive signals of different phases for
3 production of an amplitude-modulated system output.

1 54. (Withdrawn) An electronically tuned power amplifier system as in claim 52, wherein
2 said output networks are adapted to cancel time varying reactances resulting from
3 combining out-of-phase signals.

1 55. (Withdrawn) An electronically tuned power amplifier as in claim 47, further
2 comprising a passive filter coupled to said power combiner for removing undesired
3 harmonic frequencies and distortion products.

1 56. (Currently amended) An electronically tuned circuit, comprising one or more power
2 amplifiers, wherein said power amplifiers are capable of operating in a large-signal
3 mode, further wherein said one or more power amplifiers has an output network, said
4 output network including a tuning input, a network output, and an electronically
5 tunable reactive component, a device, and a control line, said control line extending
6 between said device and said electronically tunable reactive component, wherein
7 electronic tuning of said electronically tunable reactive component includes non-
8 motor operated electronic tuning when said one or more power amplifiers are
9 operating in said large-signal mode, wherein said device is configured to provide for
10 varying a control signal on said control line over more than two values further
11 ~~wherein a control line extends to said electronically tunable reactive component for~~
12 electronically varying reactance of said reactive component over more than two
13 values.

1 57. (Previously presented) An electronically tuned circuit as in claim 56, wherein said
2 output network is adapted to be tuned to a fixed or variable frequency.

1 58. (Previously presented) An electronically tuned circuit as in claim 56, wherein said
2 output network is adapted to be adjusted to maintain a match with a varying load
3 impedance at said network output.

1 59. (Previously presented) An electronically tuned circuit as in claim 56, wherein said
2 output network is adapted to modulate the signal at said network output.

1 60. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 output network includes at least two reactive components connected as a tuned
3 circuit, wherein at least one of said reactive components is adapted to being
4 electronically tuned by a tuning signal.

1 61. (Previously presented) An electronically tuned circuit as in claim 28, wherein said
2 controller converts an input signal to a voltage suitable for controlling said tunable
3 output.

1 62. (Previously presented) An electronically tuned circuit as in claim 1, wherein said
2 electronically tunable reactive component is continuously variable.

1 63. (Previously presented) An electronically tuned circuit as in claim 40, wherein said
2 electronically tunable reactive component is continuously variable.

1 64. (Previously presented) An electronically tuned circuit as in claim 56, wherein said
2 electronically tunable reactive component is continuously variable.